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(54) Title: TREATED WIPE ARTICLES (57) Abstract The present invention relates to treated wipes comprising one or more layers of a water-insoluble substrate and an aqueous liquid composition comprising a water-insoluble functional ingredient wherein the water-insoluble functional ingredient is uniformly distributed on and/or into the substrate without the need for emulsifying agents.		

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TREATED WIPE ARTICLES

FIELD OF THE INVENTION

The present invention relates to treated wipes comprising one or more layers of a water-insoluble substrate and an aqueous liquid composition comprising a water-insoluble functional ingredient wherein the water-insoluble functional ingredient is uniformly distributed on and/or into the substrate without the need for emulsifying agents.

BACKGROUND OF THE INVENTION

Treated wipes or paper-cloths for skin cleansing and refreshing are well known commercially and readily available to consumers. Such products typically comprise paper or non-woven fabric sheets which are wetted with a aqueous solution of water soluble or water dispersible ingredients. The difficulty presented by these ingredients is that they are typically hydrophobic and water insoluble. It is well-known to incorporate hydrophobic or water-insoluble cosmetic ingredients in the form of an oil-in-water emulsion. See U.S. Patent 4,559,157, granted Dec. 17, 1985 to Smith et al, "Cosmetic Applicator Useful for Skin Moisturizing". There are a number of drawbacks, however, associated with the emulsion approach. One is that these emulsions generally tend to be unstable. Another relates to the chemicals used to emulsify the hydrophobic component. Specifically, such chemical emulsifiers tend to keep hydrophobic materials from uniformly adhering to human skin. Furthermore, chemical emulsifiers tend to produce a sticky or tacky feeling on the skin.

The present inventors have developed a process for uniformly distributing hydrophobic or water-insoluble ingredients in or onto the surfaces of wipe articles wetted with an aqueous liquid without the need for emulsifying chemicals or agents.

Accordingly, it is an object of the present invention to provide treated, wetted wipes for cleansing or treating mammalian skin and/or environmental surfaces.

It is also an object of the present invention to provide wetted wipes comprising water-insoluble functional ingredients wherein the water-insoluble functional ingredients are uniformly distributed on or in wipes wetted with an aqueous liquid composition without the need for emulsifying agents.

These and other objects, advantages and novel features will become apparent to those skilled in the art from the following description and appended claims.

SUMMARY OF THE INVENTION

The present invention relates to treated wipe articles comprising:

- a). one or more layers of a water-insoluble substrate; and
- b). an aqueous liquid composition comprising:
 - i). an effective amount of a non-encapsulated, water insoluble functional ingredient; and
 - ii). an aqueous component

wherein the aqueous liquid composition is coated onto and saturates the substrate such that the water-insoluble functional ingredient is uniformly distributed onto and/or into the substrate and wherein the substrate remains saturated with the aqueous liquid composition and further wherein the aqueous liquid composition is substantially free of surfactants or surfactant mixtures having an HLB value of from about 4 to about 18.

The present invention also relates to methods of manufacturing and using the disclosed wipes.

DETAILED DESCRIPTION OF THE INVENTION

The present invention can comprise, consist of, or consist essentially of the essential elements and limitations of the invention described herein, as well any of the additional or optional ingredients, components, or limitations described herein.

All percentages, parts and ratios are based upon the total weight of the aqueous liquid composition of the present invention, unless otherwise specified. All such weights as they pertain to listed ingredients are based on the active level and, therefore, do not include carriers or by-products that may be included in commercially available materials, unless otherwise specified.

The present invention relates to treated wipe articles which provide improved skin or surface feel properties. As used herein, the term "treated wipes articles" refers to products in which one or more sheets of a water-insoluble substrate have been impregnated with an aqueous liquid composition for the purpose of rubbing the wipe product over a surface (e.g. skin) to treat the surface as needed (e.g., cleanse, condition and/or refresh). The treated wipes articles of the present invention comprise a water-insoluble substrate and an aqueous liquid composition comprising water-insoluble functional ingredients, wherein the aqueous liquid composition is coated onto or impregnated into the substrate such that the substrate is saturated with the aqueous liquid composition and such that water-insoluble functional ingredient is uniformly

distributed onto and/or in the substrate and wherein the aqueous liquid composition is substantially free of conventional emulsifying surfactants. The essential and optional components used to prepare the treated wipe articles of the present invention, as well as the process for preparing and using them, are described in detail as follows:

ESSENTIAL COMPONENTS

A. Water-Insoluble Substrate

The products of the present invention comprise a water insoluble substrate. By "water insoluble" is meant that the substrate does not dissolve in or readily break apart upon immersion in water. The water insoluble substrate is the implement or vehicle for delivering the water-insoluble functional ingredient of the present invention to surfaces in need of treatment (e.g., skin).

A wide variety of materials can be used as the substrate. The following nonlimiting characteristics are desirable: (i) sufficient wet strength for use, (ii) sufficient abrasivity, (iii) sufficient loft and porosity, (iv) sufficient thickness, and (v) appropriate size.

Nonlimiting examples of suitable insoluble substrates which meet the above criteria include nonwoven substrates, woven substrates, hydroentangled substrates, air entangled substrates, natural sponges, synthetic sponges, polymeric netted meshes, and the like. Preferred embodiments employ nonwoven substrates since they are economical and readily available in a variety of materials. By nonwoven is meant that the layer is comprised of fibers which are not woven into a fabric but rather are formed into a sheet, mat, or pad layer. The fibers can either be random (i.e., randomly aligned) or they can be carded (i.e. combed to be oriented in primarily one direction). Furthermore, the nonwoven substrate can be composed of a combination of layers of random and carded fibers.

Nonwoven substrates may be comprised of a variety of materials both natural and synthetic. By natural is meant that the materials are derived from plants, animals, insects or byproducts of plants, animals, and insects. By synthetic is meant that the materials are obtained primarily from various man-made materials or from natural materials which have been further altered. The conventional base starting material is usually a fibrous web comprising any of the common synthetic or natural textile-length fibers, or mixtures thereof.

Nonlimiting examples of natural materials useful in the present invention are silk fibers, keratin fibers and cellulosic fibers. Nonlimiting examples of keratin fibers include those selected from the group consisting of wool fibers, camel hair fibers, and the like. Nonlimiting

examples of cellulosic fibers include those selected from the group consisting of wood pulp fibers, cotton fibers, hemp fibers, jute fibers, flax fibers, and mixtures thereof.

Nonlimiting examples of synthetic materials useful in the present invention include those selected from the group consisting of acetate fibers, acrylic fibers, cellulose ester fibers, modacrylic fibers, polyamide fibers, polyester fibers, polyolefin fibers, polyvinyl alcohol fibers, rayon fibers, polyurethane foam, and mixtures thereof. Examples of some of these synthetic materials include acrylics such as acrilan, creslan, and the acrylonitrile-based fiber, orlon; cellulose ester fibers such as cellulose acetate, arnel, and acele; polyamides such as nylons (e.g., nylon 6, nylon 66, nylon 610, and the like); polyesters such as fortrel, kodel, and the polyethylene terephthalate fiber, dacron; polyolefins such as polypropylene, polyethylene; polyvinyl acetate fibers; polyurethane foams and mixtures thereof. These and other suitable fibers and the nonwoven materials prepared therefrom are generally described in Riedel, "Nonwoven Bonding Methods and Materials," Nonwoven World (1987); The Encyclopedia Americana, vol. 11, pp. 147-153, and vol. 26, pp. 566-581 (1984); U.S. Patent No. 4,891,227, to Thaman et al., issued January 2, 1990; and U.S. Patent No. 4,891,228 which are all incorporated by reference herein in their entirety.

Nonwoven substrates made from natural materials consist of webs or sheets most commonly formed on a fine wire screen from a liquid suspension of the fibers. See C.A. Hampel et al., The Encyclopedia of Chemistry, third edition, 1973, pp. 793-795 (1973); The Encyclopedia Americana, vol. 21, pp. 376-383 (1984); and G.A. Smook, Handbook of Pulp and Paper Technologies, Technical Association for the Pulp and Paper Industry (1986); which are incorporated by reference herein in their entirety.

Substrates made from natural materials useful in the present invention can be obtained from a wide variety of commercial sources. Nonlimiting examples of suitable commercially available paper layers useful herein include Airtex^R, an embossed airlaid cellulosic layer having a base weight of about 71 gsy, available from James River, Green Bay, WI; and Walkisoft^R, an embossed airlaid cellulosic having a base weight of about 75 gsy, available from Walkisoft U.S.A., Mount Holly, NC.

Methods of making nonwoven substrates are well known in the art. Generally, these nonwoven substrates can be made by air-laying, water-laying, meltblowing, coforming, spunbonding, or carding processes in which the fibers or filaments are first cut to desired lengths from long strands, passed into a water or air stream, and then deposited onto a screen through which the fiber-laden air or water is passed. The resulting layer, regardless of its method of

production or composition, is then subjected to at least one of several types of bonding operations to anchor the individual fibers together to form a self-sustaining web. In the present invention the nonwoven layer can be prepared by a variety of processes including hydroentanglement, thermally bonding or thermo-bonding, and combinations of these processes. Moreover, the substrates of the present invention can consist of a single layer or multiple layers. In addition, a multilayered substrate can include films and other nonfibrous materials. Processes for preparing hydroentangled webs are well known in the art. See, for example, Evans; U.S. Patent 3,485,786; issued December 23, 1969; Kalwarres; U.S. Patent 2,862,251 and Griswold; U.S. Patent 3,025,585, all of which describe hydroentangling procedures generally and all of which are herein incorporated by reference. See also U.S. Patent 5,674,591; James et al; issued October 7, 1997 which specifically describes a hydroentangling process, including the apparatus used in said process, which can be used to prepare the patterned web. U.S. Patent 5,674,591 is incorporated herein in its entirety.

Nonwoven substrates made from synthetic materials useful in the present invention can also be obtained from a wide variety of commercial sources. Nonlimiting examples of suitable nonwoven layer materials useful herein include PGI Miratec Herringbone, a patterned hydroentangled material containing about 30% rayon and 70% polyester, and having a basis weight of about 56 grams per square yard (gsy), available from PGI/Chicopee, Dayton N.J.; PGI Miratec Starburst, a patterned hydroentangled material containing about 30% rayon and 70% polyester, and having a basis weight of about 56 grams per square yard (gsy), available from PGI/Chicopee, Dayton N.J.; Novonet^R 149-616, a thermo-bonded grid patterned material containing about 100% polypropylene, and having a basis weight of about 50 gsy, available from Veratec, Inc., Walpole, MA; Novonet^R 149-801, a thermo-bonded grid patterned material containing about 69% rayon, about 25% polypropylene, and about 6% cotton, and having a basis weight of about 75 gsy, available from Veratec, Inc. Walpole, MA; Novonet^R 149-191, a thermo-bonded grid patterned material containing about 69% rayon, about 25% polypropylene, and about 6% cotton, and having a basis weight of about 100 gsy, available from Veratec, Inc. Walpole, MA; HEF Nubtex^R 149-801, a nubbed, apertured hydroentangled material, containing about 100% polyester, and having a basis weight of about 70 gsy, available from Veratec, Inc. Walpole, MA; Keybak^R 951V, a dry formed apertured material, containing about 75% rayon, about 25% acrylic fibers, and having a basis weight of about 43 gsy, available from PGI/Chicopee, Dayton, NJ; Keybak^R 1368, an apertured material, containing about 75% rayon,

about 25% polyester, and having a basis weight of about 39 gsy, available from PGI/Chicopee, Dayton, NJ; Duralace^R 1236, an apertured, hydroentangled material, containing about 100% rayon, and having a basis weight from about 40 gsy to about 115 gsy, available from PGI/Chicopee, Dayton, NJ; Duralace^R 5904, an apertured, hydroentangled material, containing about 100% polyester, and having a basis weight from about 40 gsy to about 115 gsy, available from PGI/Chicopee, Dayton, NJ; Sontara 8877, an apertured hydroentangled material, containing about 50% Nylon and about 50% Pulp, and having a basis weight of about 68 gsm, available from Dupont Chemical Corp.

Alternatively, the water insoluble substrate can be a polymeric mesh sponge as described in U.S. Patent 5,650,384, incorporated by reference herein in its entirety. The polymeric sponge comprises a plurality of plies of an extruded tubular netting mesh prepared from a strong flexible polymer, such as addition polymers of olefin monomers and polyamides of polycarboxylic acids. Although these polymeric sponges are designed to be used in conjunction with a liquid cleanser, these types of sponges can be used as the water insoluble substrate in the present invention.

The substrate can be made into a wide variety of shapes and forms including flat pads, thick pads, thin sheets, ball-shaped implements, irregularly shaped implements, and having sizes ranging from a surface area of about a square inch to about hundreds of square inches. The exact size will depend upon the desired use and product characteristics. Especially convenient are square, circular, rectangular, or oval pads having a surface area of from about 1 in² to about 144 in², preferably from about 10 in² to about 120 in², and more preferably from about 30 in² to about 80 in², and a thickness of from about 1 mil to about 500 mil, preferably from about 5 mil to about 250 mil, and more preferably from about 10 mil to about 100 mil.

B. The Aqueous Liquid Composition

1. Water-insoluble functional ingredient

The wipe articles of the present invention are coated and saturated with an aqueous liquid composition such that the substrate remains saturated with the aqueous liquid composition. By the term "coated," as used herein means to add to and/or impregnate the substrate with the aqueous liquid composition. The term "saturated," as used herein means the substrate comprises an aqueous liquid composition such that the aqueous liquid composition preferably comprises from about 100% to about 400%, preferably from about 200% to about 300% by weight of the absorbent substrate sheet. By the phrase "remains saturated with the

aqueous liquid composition," as used herein means that the substrate is not dried during the interval between the saturation of the wipe with the aqueous liquid composition and application of the wipe to a surface (e.g., skin) in need of treatment. The term "treat or treatment," as used herein refers to the ability to eradicate or attenuate an existing disease or condition. The present invention can also be used prophylactically to prevent undesirable diseases or conditions. The aqueous liquid composition comprises an effective amount of a water-insoluble, non-encapsulated functional ingredient. The water-insoluble functional ingredient may be solid or liquid, preferably liquid. The aqueous liquid composition used in the present invention preferably comprises from about 0.1% to about 50%, more preferably from about 0.2% to about 40%, and most preferably from about 0.5% to about 30% by weight of a water-insoluble functional ingredient. The term "water-insoluble," as used herein means a material that is hydrophobic and not soluble in distilled (or equivalent) water, at 25°C, at a concentration of 0.2% by weight, and preferably not soluble at 0.1% by weight. The term "nonencapsulated," as used herein means the water-insoluble functional ingredient is not separated from the immediate environment by a coating or encapsulating material. The term "functional ingredient" can be defined as any ingredient which when released from the wipe performs some function relative to the surface to which it is applied. Thus, if the wetted wipes of the present invention are to be applied to the human skin, the active ingredient may be a drug or beauty aid and might comprise anti-infectives such as antibiotics, antimicrobials, fungicides, antiperspirants, deodorants, antipyretics, anesthetics, sunscreens, emollients, conditioning oils, humectants and insect repellants. A detailed description of such actives along with suitable examples thereof is found in U.S. Patents 5,665,364 and 5,716, 920, both of which are herein incorporated by reference in its entirety. If they are to be used for wiping environmental surfaces in the home (e.g., tables, countertops and the like) or for agricultural, food service, veterinary or medical applications, the functional ingredient might be a wax or polish, a fragrance, a disinfectant or an insecticide. Mixtures of the above water-insoluble functional ingredients may also be used.

Water-insoluble functional ingredients preferred for use herein are water insoluble antimicrobials. A detailed description of useful antimicrobials is found U.S. Patents 5,686,089; 3,835,057; and 4,714,563; all of which are herein incorporated by reference in their entirety. When the water-insoluble functional ingredient is an antimicrobial, the water-insoluble functional ingredient is preferably present at a concentration of from about 0.001% to about 5%, more preferably 0.05% to about 1%, even more preferably from about 0.05% to about 0.5%, and most preferably 0.1% to about 0.25%.

Also useful as antimicrobials are the so-called "natural" antibacterial actives, referred to as natural essential oils. These actives derive their names from their natural occurrence in plants. Typical natural essential oil antibacterial actives include oils of anise, lemon, orange, rosemary, wintergreen, thyme, lavender, cloves, hops, tea tree, citronella, wheat, barley, lemongrass, cedar leaf, cedarwood, cinnamon, fleagrass, geranium, sandalwood, violet, cranberry, eucalyptus, vervain, peppermint, gum benzoin, basil, fennel, fir, balsam, menthol, omea origanum, *Hydastis carradensis*, *Berberidaceae daceae*, *Ratanhiae* and *Curcuma longa*. Also included in this class of natural essential oils are the key chemical components of the plant oils which have been found to provide the antimicrobial benefit. These chemicals include, but are not limited to anethol, catechole, camphene, carvacol, eugenol, eucalyptol, ferulic acid, farnesol, hinokitiol, tropolone, limonene, menthol, methyl salicylate, thymol, terpineol, verbenone, berberine, ratanhia extract, caryophellene oxide, citronellic acid, curcumin, nerolidol and geraniol.

Additional active agents are antibacterial metal salts. This class generally includes salts of metals in groups 3b-7b, 8 and 3a-5a. Specifically are the salts of aluminum, zirconium, zinc, silver, gold, copper, lanthanum, tin, mercury, bismuth, selenium, strontium, scandium, yttrium, cerium, praseodymium, neodymium, promethum, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium and mixtures thereof.

Preferred water-insoluble antimicrobials include piroctonecolamine (hereinafter Octopirox®) available from Hoechst AG; 2,4, 4'-trichloro-2'-hydroxy diphenylether (hereinafter "TCS" or Triclosan®) available from Ciba-Geigy Corp.; 3,4,4'-trichlorocarbanilide (hereinafter "TCC" or "Triclocarban®") available from Bayer AG; para -chloro-meta-xyleneol (hereinafter PCMX) available from Rhone Poulenc; zinc pyrithione (hereinafter "ZPT") available from the Olin Corp.; essential oils and their key ingredients and mixtures thereof.

Also preferred for use as the water-insoluble functional ingredient are conditioning agents. Useful water-insoluble conditioning agents are described in detail in previously incorporated U.S. Patents 5,665,364 and 5,716, 920. Preferred water-insoluble conditioning agents include fatty acids, polyol polyesters, glycerin mono-esters, glycerin di-esters, glycerin tri-esters, emollient esters (e.g., stearic acid derivatives such as methyl isostearate), epidermal and sebaceous hydrocarbons, polyethylene wax, lanolin, mineral oil, silicone oil, silicone gum, vegetable oil, vegetable oil adduct, petrolatum, nonionic polymers, and mixtures thereof. When the water-insoluble functional ingredient is a conditioning agent, the water-insoluble functional ingredient is preferably present at a concentration of from about 0.1% to about 30%, more preferably 0.2% to about 10% and most preferably from about 0.5% to about 5%.

2. Aqueous Component

The aqueous liquid composition of the present invention also comprises from about 3% to about 99%, preferably from about 5% to about 97%, more preferably from about 10% to about 95%, by weight of an aqueous component. The phrase "aqueous component," as used herein refers to the water portion of the aqueous liquid composition and means water, water-phase, aqueous phase and the like. It should also be understood that the term "aqueous component" should not be taken to mean that water is present to the exclusion of all other ingredients in the water phase (e.g., ethanol).

3. Substantially Free of Conventional Emulsifying Surfactants

The present invention is preferably substantially free of surfactants or surfactant mixtures having hydrophilic-lipophilic balance (HLB) values of from about 4 to about 18, preferably from about 2 to about 18, more preferably from about 2 to about 20, and most preferably from about 1 to about 20. In general, the phrase "substantially free" means the level of such surfactants or surfactant mixtures does not exceed about 0.5%, preferably 0.3%, more preferably 0.1%, even more preferably 0.05% and is most preferably 0%. Without being limited by theory, such surfactants tend to produce a sticky or tacky like feel to surfaces (e.g., skin surfaces). HLB values for various surfactants can be found in The HLB System, ICI Americas Incorporated, May 1992, herein incorporated by reference in its entirety. The processes of the present invention as described herein permit the uniform distribution of the water-insoluble functional ingredient without the need for emulsifying surfactant.

OPTIONAL COMPONENTS

a. Anionic Surfactants

The aqueous liquid composition optionally comprises a surfactants or surfactant mixtures having HLB values outside the range of from about 4 to about 18, more preferably outside the range of from about 2 to about 20, most preferably outside the range of from about 1 to about 25. Such surfactants include anionic, cationic, nonionic, amphoteric, and zwitterionic surfactants and mixtures thereof. Preferred for use herein are anionic surfactants. Such anionic surfactants are preferably present in the aqueous liquid compositions at concentrations of from about 0.05% to about 10, preferably from about 0.1 to about 4%, and more preferably from about 0.2% to about 1%.

Nonlimiting examples of anionic surfactants useful in the compositions of the present invention are disclosed in McCutcheon's, Detergents and Emulsifiers, North American edition (1990), published by The Manufacturing Confectioner Publishing Co.; McCutcheon's,

Functional Materials, North American Edition (1992); and U.S. Patent No. 3,929,678, to Laughlin et al., issued December 30, 1975, all of which are incorporated by reference.

A wide variety of anionic surfactants are potentially useful herein. Nonlimiting examples of anionic surfactants include those selected from the group consisting of alkyl and alkyl ether sulfates, sulfated monoglycerides, sulfonated olefins, alkyl aryl sulfonates, primary or secondary alkane sulfonates, alkyl sulfosuccinates, acyl taurates, acyl isethionates, alkyl glycerylether sulfonate, sulfonated methyl esters, sulfonated fatty acids, alkyl phosphates, acyl glutamates, acyl sarcosinates, alkyl sulfoacetates, acylated peptides, alkyl ether carboxylates, acyl lactylates, anionic fluorosurfactants, and mixtures thereof. Mixtures of anionic surfactants can be used effectively in the present invention.

Anionic surfactants for use in the present compositions include alkyl and alkyl ether sulfates. These materials have the respective formulae R^1O-SO_3M and $R^1(C_2H_4O)_x-O-SO_3M$, wherein R^1 is a saturated or unsaturated, branched or unbranched alkyl group from about 8 to about 24 carbon atoms, x is 1 to 10, and M is a water-soluble cation such as ammonium, sodium, potassium, magnesium, triethanolamine, diethanolamine and monoethanolamine. The alkyl sulfates are typically made by the sulfation of monohydric alcohols (having from about 8 to about 24 carbon atoms) using sulfur trioxide or other known sulfation technique. The alkyl ether sulfates are typically made as condensation products of ethylene oxide and monohydric alcohols (having from about 8 to about 24 carbon atoms) and then sulfated. These alcohols can be derived from fats, e.g., coconut oil or tallow, or can be synthetic. Specific examples of alkyl sulfates which may be used in the present compositions are sodium, ammonium, potassium, magnesium, or TEA salts of lauryl or myristyl sulfate. Examples of alkyl ether sulfates which may be used include ammonium, sodium, magnesium, or TEA laureth-3 sulfate.

Another suitable class of anionic surfactants are the sulfated monoglycerides of the form $R^1CO-O-CH_2-C(OH)H-CH_2-O-SO_3M$, wherein R^1 is a saturated or unsaturated, branched or unbranched alkyl group from about 8 to about 24 carbon atoms, and M is a water-soluble cation such as ammonium, sodium, potassium, magnesium, triethanolamine, diethanolamine and monoethanolamine. These are typically made by the reaction of glycerin with fatty acids (having from about 8 to about 24 carbon atoms) to form a monoglyceride and the subsequent sulfation of this monoglyceride with sulfur trioxide. An example of a sulfated monoglyceride is sodium cocomonoglyceride sulfate.

Other suitable anionic surfactants include olefin sulfonates of the form R^1SO_3M , wherein R^1 is a mono-olefin having from about 12 to about 24 carbon atoms, and M is a water-soluble cation such as ammonium, sodium, potassium, magnesium, triethanolamine, diethanolamine and monoethanolamine. These compounds can be produced by the sulfonation of alpha olefins by means of uncomplexed sulfur trioxide, followed by neutralization of the acid reaction mixture in conditions such that any sulfones which have been formed in the reaction are hydrolyzed to give the corresponding hydroxyalkanesulfonate. An example of a sulfonated olefin is sodium C_{14}/C_{16} alpha olefin sulfonate.

Other suitable anionic surfactants are the linear alkylbenzene sulfonates of the form $R^1-C_6H_4-SO_3M$, wherein R^1 is a saturated or unsaturated, branched or unbranched alkyl group from about 8 to about 24 carbon atoms, and M is a water-soluble cation such as ammonium, sodium, potassium, magnesium, triethanolamine, diethanolamine and monoethanolamine. These are formed by the sulfonation of linear alkyl benzene with sulfur trioxide. An example of this anionic surfactant is sodium dodecylbenzene sulfonate.

Still other anionic surfactants suitable for the present composition include the primary or secondary alkane sulfonates of the form R^1SO_3M , wherein R^1 is a saturated or unsaturated, branched or unbranched alkyl chain from about 8 to about 24 carbon atoms, and M is a water-soluble cation such as ammonium, sodium, potassium, magnesium, triethanolamine, diethanolamine and monoethanolamine. These are commonly formed by the sulfonation of paraffins using sulfur dioxide in the presence of chlorine and ultraviolet light or another known sulfonation method. The sulfonation can occur in either the secondary or primary positions of the alkyl chain. An example of an alkane sulfonate useful herein is alkali metal or ammonium C_{13} - C_{17} paraffin sulfonates.

Still other suitable anionic surfactants are the alkyl sulfosuccinates, which include disodium N-octadecylsulfosuccinamate; diammonium lauryl sulfosuccinate; tetrasodium N-(1,2-dicarboxyethyl)-N-octadecylsulfosuccinate; diamyl ester of sodium sulfosuccinic acid; dihexyl ester of sodium sulfosuccinic acid; and dioctyl esters of sodium sulfosuccinic acid.

Also useful are taurates which are based on taurine, which is also known as 2-aminoethanesulfonic acid. Examples of taurates include N-alkyltaurines such as the one prepared by reacting dodecylamine with sodium isethionate according to the teaching of U.S. Patent 2,658,072 which is incorporated herein by reference in its entirety. Other examples based

of taurine include the acyl taurines formed by the reaction of n-methyl taurine with fatty acids (having from about 8 to about 24 carbon atoms).

Another class of anionic surfactants suitable for use in the present composition are the acyl isethionates. The acyl isethionates typically have the formula $R^1CO-O-CH_2CH_2SO_3M$ wherein R^1 is a saturated or unsaturated, branched or unbranched alkyl group having from about 10 to about 30 carbon atoms, and M is a cation. These are typically formed by the reaction of fatty acids (having from about 8 to about 30 carbon atoms) with an alkali metal isethionate. Nonlimiting examples of these acyl isethionates include ammonium cocoyl isethionate, sodium cocoyl isethionate, sodium lauroyl isethionate, and mixtures thereof.

Still other suitable anionic surfactants are the alkylglyceryl ether sulfonates of the form $R^1-OCH_2-C(OH)H-CH_2-SO_3M$, wherein R^1 is a saturated or unsaturated, branched or unbranched alkyl group from about 8 to about 24 carbon atoms, and M is a water-soluble cation such as ammonium, sodium, potassium, magnesium, triethanolamine, diethanolamine and monoethanolamine. These can be formed by the reaction of epichlorohydrin and sodium bisulfite with fatty alcohols (having from about 8 to about 24 carbon atoms) or other known methods. One example is sodium cocoglyceryl ether sulfonate.

Other suitable anionic surfactants include the sulfonated fatty acids of the form $R^1-CH(SO_4)-COOH$ and sulfonated methyl esters of the form $R^1-CH(SO_4)-CO-O-CH_3$, where R^1 is a saturated or unsaturated, branched or unbranched alkyl group from about 8 to about 24 carbon atoms. These can be formed by the sulfonation of fatty acids or alkyl methyl esters (having from about 8 to about 24 carbon atoms) with sulfur trioxide or by another known sulfonation technique. Examples include alpha sulphonated coconut fatty acid and lauryl methyl ester.

Other anionic materials include phosphates such as monoalkyl, dialkyl, and trialkylphosphate salts formed by the reaction of phosphorous pentoxide with monohydric branched or unbranched alcohols having from about 8 to about 24 carbon atoms. These could also be formed by other known phosphorylation methods. An example from this class of surfactants is sodium mono or dilaurylphosphate.

Other anionic materials include acyl glutamates corresponding to the formula $R^1CO-N(COOH)-CH_2CH_2-CO_2M$ wherein R^1 is a saturated or unsaturated, branched or unbranched alkyl or alkenyl group of about 8 to about 24 carbon atoms, and M is a water-soluble cation. Nonlimiting examples of which include sodium lauroyl glutamate and sodium cocoyl glutamate.

Other anionic materials include alkanoyl sarcosinates corresponding to the formula $R^1\text{CON}(\text{CH}_3)\text{-CH}_2\text{CH}_2\text{-CO}_2\text{M}$ wherein R^1 is a saturated or unsaturated, branched or unbranched alkyl or alkenyl group of about 10 to about 20 carbon atoms, and M is a water-soluble cation. Nonlimiting examples of which include sodium lauroyl sarcosinate, sodium cocoyl sarcosinate, and ammonium lauroyl sarcosinate.

Other anionic materials include alkyl ether carboxylates corresponding to the formula $R^1\text{-(OCH}_2\text{CH}_2)_x\text{-OCH}_2\text{-CO}_2\text{M}$ wherein R^1 is a saturated or unsaturated, branched or unbranched alkyl or alkenyl group of about 8 to about 24 carbon atoms, x is 1 to 10, and M is a water-soluble cation. Nonlimiting examples of which include sodium laureth carboxylate.

Other anionic materials include acyl lactylates corresponding to the formula $R^1\text{CO-[O-CH(CH}_3\text{)-CO]}_x\text{-CO}_2\text{M}$ wherein R^1 is a saturated or unsaturated, branched or unbranched alkyl or alkenyl group of about 8 to about 24 carbon atoms, x is 3, and M is a water-soluble cation. Nonlimiting examples of which include sodium cocoyl lactylate.

Other anionic materials include the carboxylates, nonlimiting examples of which include sodium lauroyl carboxylate, sodium cocoyl carboxylate, and ammonium lauroyl carboxylate. Anionic fluorsurfactants can also be used.

Any counter cation, M, can be used on the anionic surfactant. Preferably the counter cation is selected from the group consisting of sodium, potassium, ammonium, monoethanolamine, diethanolamine, and triethanolamine. More preferably the counter cation is ammonium.

Nonlimiting examples of preferred anionic surfactants useful herein include those selected from the group consisting of sodium and ammonium alkyl sulfates and ether sulfates having chain lengths of predominantly 12 and 14 carbon atoms, olefin sulfates having chain lengths of predominantly 14 and 16 carbon atoms, and paraffin sulfonates having chain lengths of from 13 to 17 carbon atoms, and mixtures thereof. More preferred for use herein is ammonium and sodium lauryl sulfate, ammonium and sodium myristyl sulfate, ammonium and sodium laureth-1 to laureth-4 sulfate, C14-C16 olefin sulfonates, C13-C17 paraffin sulfonates, and mixtures thereof. Most preferred is ammonium lauryl sulfate.

Another class of preferred anionic surfactants consist of surfactants which have a pKa of greater than 4.0. These acidic surfactants include the group consisting of acyl sarcosinates, acyl glutamates, alkyl ether carboxylates and mixtures thereof. Acidic surfactants have been found to be a more efficacious surfactant. Without being limited by theory, it is believed that these

surfactants provide both the acid and anionic surfactant benefit in one component. Antimicrobial wipes comprising these acidic surfactants provide better antimicrobial efficacy than other surfactants. Their acidic property also allows to the use of less separate proton donating agent, which even further improves the mildness of the antimicrobial cleansing compositions herein. When used, the acidic surfactants are used in the cleansing compositions herein at levels from about 0.1% to about 10%, preferably from about 0.2% to about 8%, more preferably from about 0.3% to about 5%, even more preferably from about 0.4% to about 2%, and most preferably from about 0.5% to about 1%.

b. Proton Donating Agents

The aqueous cleansing composition comprising the personal cleansing wipes of the present invention can optionally comprise from about 0.1% to about 10%, preferably from about 0.5% to about 8%, more preferably from about 1% to about 5%, based on the weight of the cleansing composition, of a proton donating agent. By "proton donating agent" it is meant any acid compound or mixture thereof, which results in undissociated acid on the skin after use. Proton donating agents can be organic acids, including polymeric acids, mineral acids or mixtures thereof.

A non-exclusive list of examples of organic acids which can be used as the proton donating agent are adipic acid, tartaric acid, citric acid, maleic acid, malic acid, succinic acid, glycolic acid, glutaric acid, benzoic acid, malonic acid, salicylic acid, gluconic acid, polymeric acids, their salts, precursors thereof and mixtures thereof. A non-exclusive list of examples of mineral acid for use herein are hydrochloric, phosphoric, sulfuric, and mixtures thereof.

Polymeric acids and gluconic acid are especially preferred acids for use herein from the standpoint that they cause less stinging to the skin than other acids. As used herein, the term "polymeric acid" refers to an acid with repeating units of carboxylic acid groups joined together into one chain. Suitable polymeric acids can include homopolymers, copolymers and terpolymers, but must contain at least 30 mole% carboxylic acid groups. Specific examples of suitable polymeric acids useful herein include straight-chain poly(acrylic) acid and its copolymers, both ionic and nonionic, (e.g., maleic-acrylic, sulfonic-acrylic, and styrene-acrylic copolymers), those cross-linked polyacrylic acids having a molecular weight of less than about 250,000, preferably less than about 100,000 poly (α -hydroxy) acids, poly (methacrylic) acid, and naturally occurring polymeric acids such as carageenic acid, carboxy methyl cellulose, and alginic acid. Straight-chain poly(acrylic) acids are especially preferred for use herein and are available from Rohm and Haas Co. Also preferred for use herein are organic acid precursors

such as glucono lactone. Without being limited by theory, glucono lactone hydrolyzes in water to form gluconic acid. Gluconic acid and glucono lactone are available from such suppliers as Jungbunzlauer Inc.

In one preferred embodiment of the present invention, the proton donating agent is used to buffer the pH of the aqueous cleansing composition to a pH ranging from about 3.0 to about 6.0, more preferably from about 3.0 to about 5.0 and most preferably from about 3.5 to about 4.5.

c. Water Soluble Conditioning Agents

The present invention can also optionally comprise water soluble conditioning agents. Such water soluble conditioning agents are typically included in the aqueous cleansing composition employed herein at a level ranging from about 0.1% to about 2%, preferably from about 0.2% to about 1.5%, more preferably from about 0.5% to about 1% by weight of the aqueous cleansing composition.

Nonlimiting examples of conditioning agents useful as water soluble conditioning agents include those selected from the group consisting of polyhydric alcohols, polypropylene glycols, polyethylene glycols, ureas, pyrrolidone carboxylic acids, ethoxylated and/or propoxylated C3-C6 diols and triols, alpha-hydroxy C2-C6 carboxylic acids, ethoxylated and/or propoxylated sugars, polyacrylic acid copolymers, sugars having up to about 12 carbons atoms, sugar alcohols having up to about 12 carbon atoms, and mixtures thereof. Specific examples of useful water soluble conditioning agents include materials such as urea; guanidine; glycolic acid and glycolate salts (e.g. ammonium and quaternary alkyl ammonium); lactic acid and lactate salts (e.g. ammonium and quaternary alkyl ammonium); sucrose, fructose, glucose, erythrose, erythritol, sorbitol, mannitol, glycerol, hexanetriol, propylene glycol, butylene glycol, hexylene glycol, and the like; polyethylene glycols such as PEG-2, PEG-3, PEG-30, PEG-50, polypropylene glycols such as PPG-9, PPG-12, PPG-15, PPG-17, PPG-20, PPG-26, PPG-30, PPG-34; alkoxylated glucose; hyaluronic acid; and mixtures thereof. Also useful are materials such as aloe vera in any of its variety of forms (e.g., aloe vera gel), chitin, starch-grafted sodium polyacrylates such as Sanwet (RTM) IM-1000, IM-1500, and IM-2500 (available from Celanese Superabsorbent Materials, Portsmouth, VA); lactamide monoethanolamine; acetamide monoethanolamine; and mixtures thereof. Also useful are propoxylated glycerols as described in propoxylated glycerols described in U.S. Patent No. 4,976,953, to Orr et al., issued December 11, 1990, which is incorporated by reference herein in its entirety.

d. Drying Agents

Drying agents can be employed in the aqueous cleansing compositions employed herein to boost the drying rate of the liquid composition once it applied to the skin via rubbing the wipe product on the skin.. Some aqueous cleansing compositions can give a sticky impression when they are applied to the skin, especially during the time it takes for the composition to dry. It has been found that fast-drying compositions provide a softer, smoother skin feel, with less stickiness. Suitable drying agents include isoparaffin, alcohols and combinations thereof. A mixture of isoparaffin and ethanol is especially preferred. Drying agents are typically included in the cleansing compositions employed herein at a level ranging from about 1% to about 60%, preferably from about 3% to about 40%, more preferably from about 5% to about 20% by weight.

e. Other Optional Ingredients

The aqueous liquid compositions of the present invention can comprise a wide range of other optional components. These additional components should be pharmaceutically acceptable when used on mammalian skin. The CTFA Cosmetic Ingredient Handbook, Second Edition, 1992, which is incorporated by reference herein in its entirety, describes a wide variety of nonlimiting cosmetic and pharmaceutical ingredients commonly used in the skin care industry, which are suitable for use in the compositions of the present invention. Nonlimiting examples of functional classes of ingredients are described at page 537 of this reference. Examples of these and other functional classes include: abrasives, absorbents, anticaking agents, antioxidants, vitamins, binders, biological additives, buffering agents, bulking agents, chelating agents, chemical additives, colorants, cosmetic astringents, cosmetic biocides, denaturants, drug astringents, external analgesics, film formers, fragrance components, humectants, opacifying agents, pH adjusters, preservatives, propellants, reducing agents, skin bleaching agents, and sunscreens agents.

Also useful herein are aesthetic components such as fragrances, pigments, colorings, essential oils, skin sensates, astringents, skin soothing agents, and skin healing agents.

f. Viscosity of Aqueous Liquid Composition

The aqueous liquid compositions employed in the wipes product herein preferably have a viscosity in the range of from about 1 to about 1000, preferably from about 5 to about 200 centipoise as measured by a Brookfield Digital Viscometer, Model DV-II+ Version 3.2 according to the operating instructions set forth in Manual No. M/92-161-H895.

Examples of suitable aqueous liquid compositions for use herein are set forth in the following U.S. Patents and U.S. Patent Applications, all of which are herein incorporated by

reference: U.S. Patent Application Serial Number 08/727,807 pages 3-6 and 8); U.S. Patent Application Serial Number 08/868,668 filed on June 4, 1997; U.S. Patent 4,941,995 issued July 17, 1990 to Richards et al; U.S. Patent 4,904,524 issued February 27, 1990 to Yoh; U.S. Patent 5,043,155 to Puchalski; U.S. Patent 5,534,265 to Fowler; U.S. Patent 5,648,083 to Blieszner et al.; and U.S. Patent Application Serial Number 08/736,471 filed October 24, 1996.

g. Foam Suppressors

The aqueous liquid compositions of the present invention can also include compounds for reducing or suppressing the formation of foam or suds. Suitable foam suppressors or antifoaming agents are described in detail in U.S. Patent 5,756,444, herein incorporated by reference in its entirety. Useful foam suppressors include, but are not limited to, silicone foam suppressors, silicas and mixtures thereof. Examples of useful silicone foam suppressors include, but are not limited to, AF-60, AF-66, AF-70, AF-72, AF-75, AF-93, and AF-9020 supplied by the General Electric Co. and Dow Corning's antifoam line (1500 Silicone Antifoam, 1520 Silicone Antifoam, Antifoam A, Antifoam B, DB-31 Antifoam, DB-110A Antifoam, and H-10 Antifoam). Suds suppressors are preferably present in the aqueous liquid composition at concentrations of from about 0.01% to about 3%, more preferably from about 0.25% to about 2%, most preferably from about 0.5% to about 1%.

h. Substantially Free of Amide Foam Booster

The present compositions are preferably substantially free of amide foam boosters. By "substantially free", what is meant is that the composition hereof can contain no more than about 1%, by weight, of each of these materials, preferably no more than about 0.5%, more preferably no more than about 0.25%, most preferably the present invention contains essentially zero percent of these materials. Without being limited by theory, the presence of amide foam boosters can adversely affect deposition of the water-insoluble functional ingredient of the present invention. Examples of such amide foam boosters is found in U.S. Patent 5,648,323, herein incorporated by reference in its entirety.

PREPARATION OF WIPES IMPREGNATED WITH AQUEOUS LIQUID COMPOSITION

The treated, wetted wipe articles of the present invention are manufactured by adding onto or impregnating into a water insoluble substrate an aqueous liquid composition containing a water-insoluble functional ingredient.

Techniques for coating or impregnating the water insoluble substrate are well known in the art and are not elaborated on here. Preferably, the aqueous liquid composition of the present invention is coated on by means of a process comprising at least two steps. One step involves

applying the water-insoluble functional ingredient onto the substrate. This can be accomplished by any means known to those skilled in the art: for example, by spraying, printing, splashing, dipping, soaking, or coating. Another step involves applying the aqueous component or aqueous phase to the water-insoluble substrate. This can be accomplished by such methods as, but is not limited to, flood coating, spray coating or metered dosing. More specialized techniques, such as Meyer Rod, floating knife or doctor blade, are typically used to impregnate water-insoluble substrates and may also be used herein.

After the coating or impregnating process, the aqueous liquid composition should preferably comprise from about 100% to about 400%, preferably from about 200% to about 300% by weight of the water-insoluble substrate.

Prior to or after impregnation of the aqueous liquid composition into the substrate, the substrate may be folded into stacks. The substrate is then typically packaged in any of the moisture and vapor impermeable packages known in the art.

METHOD OF USING THE TREATED WIPE ARTICLES

For treatment, the treated wipe is applied to a surface (e.g., a skin surface) via topical application to release or deposit an effective amount of the aqueous liquid composition to perform the desired function. Preferably, the treated wipes of the present invention are used to cleanse and refresh mammalian skin. The amount of water-insoluble functional ingredient delivered from the wipe and frequency of topical application can vary widely, depending upon individual needs. With respect to personal application to the skin, such application can range from about once per day to about four times daily, preferably from about twice per day to about three times daily. Number of wipes used per application can range from 1 to about 4 wipes, preferably 1 to about 2 wipes. The amount of water-insoluble functional ingredient applied is generally from about 1 mg to about 2 mg per cm² skin. The treated wipes of the present invention can also be used prophylactically by administering to healthy skin surfaces to guard from or prevent undesired skin conditions and/or infections using the dosing regimen described above.

EXAMPLES

The following examples further illustrate preferred embodiments within the scope of the present invention. The examples are given solely for the purposes of illustration and are not to be construed as limitations of the present invention as many variations of the invention are possible without departing from its spirit and scope.

Ingredients are identified by chemical or CTFA name.

Example 1

The following is an example of a water-insoluble substrate used in the present invention. A patterned hydroentangled non-woven substrate having a basis weight of 56 gms, comprising 70% polyester and 30% rayon approximately 6.5 inches wide by 7.5 inches long with a caliper of about 0.80 mm.

Example 2

The following is an example of antimicrobial wet wipe.

Ingredient	Weight %
Methyl Isostearate	0.67
Polyethylene Wax	0.3
Dimethicone	0.5
Ammonium Lauryl Sulfate	0.6
Silicone antifoam	0.2
Triclosan®	0.15
Sodium Benzoate	0.2
Tetrasodium EDTA	0.1
D- Gluconic Acid	2.5
SD Alcohol 40	10
Fragrance	0.03
Water	QS

In a suitable vessel, the ammonium laurel sulfate, silicone antifoam, Triclosan®, sodium benzoate, tetrasodium EDTA, d-gluconic acid, alcohol, fragrance and water are mixed at room temperature to form an aqueous phase. In a separate, suitable vessel, the methyl isostearate, polyethylene wax, dimethicone are mixed at elevated temperatures to form a water insoluble phase. The water-insoluble phase is then heated to 90°C. The water-insoluble mixture is allowed to cool to room temperature and is then reheated in a Hot Melt Spray unit with a 0.018" spray nozzle (KS10 Slaughterback Unit). The solution is brought to a temperature of 90° C and sprayed onto a moving web of the substrate in Example 1 with variable air pressure and distance from the web. The coated roll is then transferred to an aqueous phase application system for loading. The aqueous phase is applied onto the substrate using a lotion bar.

Example 3

The following is an example of antimicrobial wet wipe.

Ingredient	Weight %
Methyl Isostearate	0.67
Polyethylene Wax	0.3
Dimethicone	0.5
Ammonium Lauryl Sulfate	0.6
Silicone antifoam	0.2

Triclosan®	0.15
Sodium Benzoate	0.2
Tetrasodium EDTA	0.1
D- Gluconic Acid	2.5
Fragrance	0.03
Water	QS

In a suitable vessel, the ammonium laurel sulfate, silicone antifoam, Triclosan®, sodium benzoate, tetrasodium EDTA, d-gluconic acid, alcohol, fragrance and water are mixed at room temperature to form an aqueous phase. In a separate, suitable vessel, the methyl isostearate, polyethylene wax, dimethicone are mixed at elevated temperatures to form a water insoluble phase. The water-insoluble phase is then heated to 90°C. The water-insoluble mixture is allowed to cool to room temperature and is then reheated in a Hot Melt Spray unit with a 0.018" spray nozzle (KS10 Slautterback Unit). The solution is brought to a temperature of 90° C and sprayed onto a moving web of the substrate in Example 1 with variable air pressure and distance from the web. The coated roll is then transferred to an aqueous phase application system for loading. The aqueous phase is applied onto the substrate using a lotion bar.

Example 4

The following is an example of antimicrobial wet wipe.

Ingredient	Weight %
Dimethicone	0.5
Ammonium Lauryl Sulfate	0.6
Silicone antifoam	0.2
Triclosan®	0.15
Sodium Benzoate	0.2
Tetrasodium EDTA	0.1
D- Gluconic Acid	2.5
SD Alcohol 40	10
Fragrance	0.03
Water	QS

In a suitable vessel, the ammonium laurel sulfate, silicone antifoam, Triclosan®, sodium benzoate, tetrasodium EDTA, d-gluconic acid, alcohol and water are mixed at room temperature to form an aqueous phase. In a separate, suitable vessel, the dimethicone and fragrance are mixed at elevated temperatures to form a water insoluble phase. The water-insoluble phase is then heated to 90°C. The water-insoluble mixture is allowed to cool to room temperature and is then reheated in a Hot Melt Spray unit with a 0.018" spray nozzle (KS10 Slautterback Unit). The solution is brought to a temperature of 90° C and sprayed onto a moving web of the substrate in Example 1 with variable air pressure and distance from the web. The coated roll is

then transferred to an aqueous phase application system for loading. The aqueous phase is applied onto the substrate using a lotion bar.

Example 5

The following is an example of antimicrobial wet wipe.

Ingredient	Weight %
Methyl Isostearate	0.67
Polyethylene Wax	0.3
Dimethicone	0.5
Ammonium Lauryl Sulfate	0.6
Silicone antifoam	0.2
Triclocarban®	0.15
Sodium Benzoate	0.2
Tetrasodium EDTA	0.1
glucono lactone	2.3
SD Alcohol 40	10
Fragrance	0.03
Water	QS

In a suitable vessel, the ammonium laurel sulfate, silicone antifoam, Triclocarban®, sodium benzoate, tetrasodium EDTA, glucono lactone, alcohol, fragrance and water are mixed at room temperature to form an aqueous phase. In a separate, suitable vessel, the methyl isostearate, polyethylene wax, dimethicone are mixed at elevated temperatures to form a water insoluble phase. The water-insoluble phase is then heated to 90°C. The water-insoluble mixture is allowed to cool to room temperature and is then reheated in a Hot Melt Spray unit with a 0.018" spray nozzle (KS10 Slautterback Unit). The solution is brought to a temperature of 90° C and sprayed onto a moving web of the substrate in Example 1 with variable air pressure and distance from the web. The coated roll is then transferred to an aqueous phase application system for loading. The aqueous phase is applied onto the substrate using a lotion bar.

Example 6

The following is an example of antimicrobial wet wipe.

Ingredient	Weight %
Dimethicone	0.5
Ammonium Lauryl Sulfate	0.6
Silicone antifoam	0.2
Triclosan®	0.15
Sodium Benzoate	0.2
Tetrasodium EDTA	0.1
glucono lactone	2.3
SD Alcohol 40	10
Fragrance	0.03

Water	QS
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In a suitable vessel, the ammonium laurel sulfate, silicone antifoam, Triclosan®, sodium benzoate, tetrasodium EDTA, glucono lactone, alcohol and water are mixed at room temperature to form an aqueous phase. In a separate, suitable vessel, the dimethicone and fragrance are mixed at elevated temperatures to form a water insoluble phase. The water-insoluble phase is then heated to 90°C. The water-insoluble mixture is allowed to cool to room temperature and is then reheated in a Hot Melt Spray unit with a 0.018" spray nozzle (KS10 Slautterback Unit). The solution is brought to a temperature of 90° C and sprayed onto a moving web of the substrate in Example 1 with variable air pressure and distance from the web. The coated roll is then transferred to an aqueous phase application system for loading. The aqueous phase is applied onto the substrate using a lotion bar.

Example 7

The following is an example of antimicrobial wet wipe.

Ingredient	Weight %
Methyl Isostearate	0.67
Polyethylene Wax	0.3
Dimethicone	0.5
Ammonium Lauryl Sulfate	0.6
Silicone antifoam	0.2
Para-chloro-meta-xyleneol	0.15
Sodium Benzoate	0.2
Tetrasodium EDTA	0.1
glucono lactone	2.3
Fragrance	0.03
Water	QS

In a suitable vessel, the ammonium laurel sulfate, silicone antifoam, para-chloro-meta-xyleneol, sodium benzoate, tetrasodium EDTA, glucono lactone, alcohol, fragrance and water are mixed at room temperature to form an aqueous phase. In a separate, suitable vessel, the methyl isostearate, polyethylene wax, dimethicone are mixed at elevated temperatures to form a water insoluble phase. The water-insoluble phase is then heated to 90°C. The water-insoluble mixture is allowed to cool to room temperature and is then reheated in a Hot Melt Spray unit with a 0.018" spray nozzle (KS10 Slautterback Unit). The solution is brought to a temperature of 90° C and sprayed onto a moving web of the substrate in Example 1 with variable air pressure and distance from the web. The coated roll is then transferred to an aqueous phase application system for loading. The aqueous phase is applied onto the substrate using a lotion bar.

Example 8

The following is an example of a non-greasy moisturizing wet wipe.

Ingredient	Weight %
Methyl Isostearate	0.67
Polyethylene Wax	0.3
Dimethicone	0.5
Ammonium Lauryl Sulfate	0.6
Silicone antifoam	0.2
Sodium Benzoate	0.2
Tetrasodium EDTA	0.1
D- Gluconic Acid	2.5
SD Alcohol 40	10
Fragrance	0.03
Water	QS

In a suitable vessel, the ammonium laurel sulfate, silicone antifoam, sodium benzoate, tetrasodium EDTA, d-gluconic acid, alcohol, fragrance and water are mixed at room temperature to form an aqueous phase. In a separate, suitable vessel, the methyl isostearate, polyethylene wax, dimethicone are mixed at elevated temperatures to form a water insoluble phase. The water-insoluble phase is then heated to 90°C. The water-insoluble mixture is allowed to cool to room temperature and is then reheated in a Hot Melt Spray unit with a 0.018" spray nozzle (KS10 Slaughterback Unit). The solution is brought to a temperature of 90° C and sprayed onto a moving web of the substrate in Example 1 with variable air pressure and distance from the web. The coated roll is then transferred to an aqueous phase application system for loading. The aqueous phase is applied onto the substrate using a lotion bar.

Example 9

The following is an example of a non-greasy moisturizing wet wipe.

Ingredient	Weight %
Methyl Isostearate	0.67
Polyethylene Wax	0.3
Dimethicone	0.5
Ammonium Lauryl Sulfate	0.6
Silicone antifoam	0.2
Sodium Benzoate	0.2
Tetrasodium EDTA	0.1
D- Gluconic Acid	2.5
Fragrance	0.03
Water	QS

In a suitable vessel, the ammonium laurel sulfate, silicone antifoam, sodium benzoate, tetrasodium EDTA, d-gluconic acid, fragrance and water are mixed at room temperature to form an aqueous phase. In a separate, suitable vessel, the methyl isostearate, polyethylene wax, dimethicone are mixed at elevated temperatures to form a water insoluble phase. The water-insoluble phase is then heated to 90°C. The water-insoluble mixture is allowed to cool to room temperature and is then reheated in a Hot Melt Spray unit with a 0.018" spray nozzle (KS10 Slautterback Unit). The solution is brought to a temperature of 90° C and sprayed onto a moving web of the substrate in Example 1 with variable air pressure and distance from the web. The coated roll is then transferred to an aqueous phase application system for loading. The aqueous phase is applied onto the substrate using a lotion bar.

Example 10

The following is an example of a non-greasy moisturizing wet wipe.

Ingredient	Weight %
Dimethicone	0.5
Ammonium Lauryl Sulfate	0.6
Silicone antifoam	0.2
Sodium Benzoate	0.2
Tetrasodium EDTA	0.1
D- Gluconic Acid	2.5
SD Alcohol 40	10
Fragrance	0.03
Water	QS

In a suitable vessel, the ammonium laurel sulfate, silicone antifoam, sodium benzoate, tetrasodium EDTA, d-gluconic acid, alcohol, and water are mixed at room temperature to form an aqueous phase. In a separate, suitable vessel, the dimethicone and fragrance are mixed at elevated temperatures to form a water insoluble phase. The water-insoluble phase is then heated

to 90°C. The water-insoluble mixture is allowed to cool to room temperature and is then reheated in a Hot Melt Spray unit with a 0.018" spray nozzle (KS10 Slaughterback Unit). The solution is brought to a temperature of 90° C and sprayed onto a moving web of the substrate in Example 1 with variable air pressure and distance from the web. The coated roll is then transferred to an aqueous phase application system for loading. The aqueous phase is applied onto the substrate using a lotion bar.

Example 11

The following is an example of a sunscreen wet wipe.

Ingredient	Weight %
Methyl Isostearate	0.67
Polyethylene Wax	0.3
Dimethicone	0.5
Ammonium Lauryl Sulfate	0.6
Silicone antifoam	0.2
Sodium Benzoate	0.2
Tetrasodium EDTA	0.1
Fragrance	0.03
oxybenzone	3
ethylhexyl p-methoxy cinnamate	6
Water	QS

In a suitable vessel, the ammonium laurel sulfate, silicone antifoam, sodium benzoate, tetrasodium EDTA, fragrance and water are mixed at room temperature to form an aqueous phase. In a separate, suitable vessel, the methyl isostearate, polyethylene wax, dimethicone, oxybenzone, ethylhexyl p-methoxy cinnamate, are mixed at elevated temperatures to form a water insoluble phase. The water-insoluble phase is then heated to 90°C. The water-insoluble mixture is allowed to cool to room temperature and is then reheated in a Hot Melt Spray unit with a 0.018" spray nozzle (KS10 Slaughterback Unit). The solution is brought to a temperature of 90° C and sprayed onto a moving web of the substrate in Example 1 with variable air pressure and distance from the web. The coated roll is then transferred to an aqueous phase application system for loading. The aqueous phase is applied onto the substrate using a lotion bar.

Example 12

The following is an example of a wet wipe for cleansing and waxing hard surfaces.

Ingredient	Weight %
Polyethylene Wax	0.3
Dimethicone	0.5
Ammonium Lauryl Sulfate	0.6
Silicone antifoam	0.2
Sodium Benzoate	0.2
Tetrasodium EDTA	0.1
Fragrance	0.03
Water	QS

In a suitable vessel, the ammonium laurel sulfate, silicone antifoam, sodium benzoate, tetrasodium EDTA, fragrance and water are mixed at room temperature to form an aqueous phase. In a separate, suitable vessel, the polyethylene wax, dimethicone, oxybenzone, ethylhexyl p-methoxy cinnamate, are mixed at elevated temperatures to form a water insoluble phase. The water-insoluble phase is then heated to 90°C. The water-insoluble mixture is allowed to cool to room temperature and is then reheated in a Hot Melt Spray unit with a 0.018" spray nozzle (KS10 Slaughterback Unit). The solution is brought to a temperature of 90° C and sprayed onto a moving web of the substrate in Example 1 with variable air pressure and distance from the web. The coated roll is then transferred to an aqueous phase application system for loading. The aqueous phase is applied onto the substrate using a lotion bar.

Example 13

The following is an example of an insect repellent wet wipe.

Ingredient	Weight %
Methyl Isostearate	0.67
Polyethylene Wax	0.3
Dimethicone	0.5
Ammonium Lauryl Sulfate	0.6
Silicone antifoam	0.2
Sodium Benzoate	0.2
Tetrasodium EDTA	0.1
Fragrance	0.03
DEET-diethyl toluamide	5
Water	QS

In a suitable vessel, the ammonium laurel sulfate, silicone antifoam, sodium benzoate, tetrasodium EDTA, fragrance and water are mixed at room temperature to form an aqueous phase. In a separate, suitable vessel, the methyl isostearate, polyethylene wax, dimethicone, DEET-diethyl toluamide are mixed at elevated temperatures to form a water insoluble phase. The water-insoluble phase is then heated to 90°C. The water-insoluble mixture is allowed to cool to room temperature and is then reheated in a Hot Melt Spray unit with a 0.018" spray

nozzle (KS10 Slatutterback Unit). The solution is brought to a temperature of 90° C and sprayed onto a moving web of the substrate in Example 1 with variable air pressure and distance from the web. The coated roll is then transferred to an aqueous phase application system for loading. The aqueous phase is applied onto the substrate using a lotion bar.

WHAT IS CLAIMED IS:

1. A treated wipe article comprising:
 - a). one or more layers of a water-insoluble substrate; and
 - b). an aqueous liquid composition comprising:
 - i). an effective amount of a non-encapsulated, water insoluble functional ingredient; and
 - ii). an aqueous componentwherein the aqueous liquid composition is coated onto and saturates the substrate such that the water-insoluble functional ingredient is uniformly distributed onto and/or into the substrate and wherein the substrate remains saturated with the aqueous liquid composition and further wherein the aqueous liquid composition is substantially free of surfactants or surfactant mixtures having an HLB value of from about 4 to about 18.
2. A treated wipe according to Claim 1, wherein the water-insoluble functional ingredient is selected from the group consisting of antibiotics, antimicrobials, fungicides, antiperspirants, deodorants, antipyretics, anesthetics, sunscreens, emollients, conditioning agent, humectants and insect repellants and mixtures thereof.
3. A treated wipe according to Claim 2, wherein the water-insoluble functional ingredient is an antimicrobial active is selected from the group consisting of 2,4, 4'-trichloro-2'-hydroxy diphenylether; 3,4,4'-trichlorocarbaniide; pyrrithiones and salts thereof; para-chloro-meta-xyleneol; natural essential oils and their key ingredients; and mixtures thereof.
4. A treated wipe according to Claim 3, wherein the antimicrobial active is 2,4, 4'-trichloro-2'-hydroxy diphenylether.
5. A treated wipe according to Claim 2, wherein the water-insoluble functional ingredient is a conditioning agent.
6. A treated wipe according to Claim 5, wherein the conditioning agent is selected from the group consisting of esters of fatty acids, polyol polyesters, glycerin mono-esters, glycerin di-esters, glycerin tri-esters, methyl isostearate, polyethylene wax, epidermal

and sebaceous hydrocarbons, lanolin, mineral oil, silicone oil, silicone gum, vegetable oil, vegetable oil adduct, petrolatum, nonionic polymers, and mixtures thereof.

7. A treated wipe according to Claim 1, further comprising a proton donating agent.
8. A treated wipe according to Claim 7, wherein the proton donating agent is an organic acid selected from the group consisting of adipic acid, tartaric acid, citric acid, maleic acid, malic acid, succinic acid, glycolic acid, glutaric acid, benzoic acid, malonic acid, salicylic acid, gluconic acid, polyacrylic acid, precursors thereof, salts thereof, and mixtures thereof.
9. A treated wipe according to Claim 8, wherein the proton donating agent is gluconic acid.
10. A treated wipe according to Claim 8, wherein the proton donating agent is an organic acid precursor.
11. A treated wipe according to Claim 10, wherein the organic acid precursor is glucono lactone.
12. A method of manufacturing a treated wipe article comprising the step of coating onto and/or saturating a water-insoluble substrate with an aqueous liquid composition comprising:
 - i). an effective amount of a non-encapsulated, water insoluble functional ingredient; and
 - ii). an aqueous componentsuch that the water-insoluble functional ingredient is uniformly distributed onto and/or into the substrate and wherein the substrate remains saturated with the aqueous liquid composition and further wherein the aqueous liquid composition is substantially free of surfactants or surfactant mixtures having an HLB value of from about 4 to about 18.
13. A method of manufacturing according to Claim 12, wherein the aqueous liquid composition is applied by separately applying the water-insoluble functional ingredient and the aqueous component to the water insoluble substrate.

14. A method of cleansing and/or treating hair and skin by administering to the skin or hair in need of cleansing and/or treatment a treated wipe comprising:
- a). one or more layers of a water-insoluble substrate; and
 - b). an aqueous liquid composition comprising:
 - i). an effective amount of a non-encapsulated, water insoluble functional ingredient; and
 - ii). an aqueous component
- wherein the aqueous liquid composition is coated onto and saturates the substrate such that the water-insoluble functional ingredient is uniformly distributed onto and/or into the substrate and wherein the substrate remains saturated with the aqueous liquid composition and further wherein the aqueous liquid composition is substantially free of surfactants or surfactant mixtures having an HLB value of from about 4 to about 18.
15. A method of cleansing and/or treating environmental surfaces by administering to environmental surfaces in need of cleansing and/or treatment a treated wipe comprising:
- a). one or more layers of a water-insoluble substrate; and
 - b). an aqueous liquid composition comprising:
 - i). an effective amount of a non-encapsulated, water insoluble functional ingredient; and
 - ii). an aqueous component
- wherein the aqueous liquid composition is coated onto and saturates the substrate such that the water-insoluble functional ingredient is uniformly distributed onto and/or into the substrate and wherein the substrate remains saturated with the aqueous liquid composition and further wherein the aqueous liquid composition is substantially free of surfactants or surfactant mixtures having an HLB value of from about 4 to about 18.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB 99/01031

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 A01N25/34 A61K9/70 A61K7/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A01N A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>WO 98 17239 A (PROCTER & GAMBLE) 30 April 1998 (1998-04-30) page 3, paragraph 1 page 5, paragraph 1 page 10, paragraph 2 - paragraph 5 page 12; examples I,,II page 12, paragraph 2 page 12, paragraph 5 ---</p> <p style="text-align: center;">-/--</p>	1,2,5-8, 12,14,15

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/IB 99/01031

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
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INTERNATIONAL SEARCH REPORT

International Application No

PCT/IB 99/01031

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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P,X	<p>WO 98 55096 A (PROCTER & GAMBLE) 10 December 1998 (1998-12-10) page 23; example 5 page 24; example 7 -----</p>	1-15

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